

## REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

### *Status of the claims*

Claims 1-5 and 7-24 and 44 are currently pending, with claims 1, 13, 17 and 22 being independent claims. Claims 1, 13, 17 and 22 have been amended to overcome the PTO's obviousness rejections. Claim 6 has been cancelled, because, the subject matter of claim 6 is now introduced in amended claim 1. Claims 2-4 have been amended to recite a system [that] "performs" a specific function. The amended claims obviate the statements in the Office Action about the absence of a structural and/or functional limitation which precludes claims 2-4 from receiving patentable weight. Applicant therefore respectfully requests the Examiner to withdraw the objection. Applicant also amends claim 20 to recite providing UVA phototherapy to a "human subject suffering from lupus." This amendment obviates the rejection in the Office Action that the limitations of claim 20 cannot receive patentable weight because of the lack of a functional limitation. Claim 7 has been amended to correct its dependency. Applicants also add new claim 44 which recites that the UVA light emitted by a light emitting diode or a nanostructure UV light emitting device is UVA-1 light as described in the specification.

The amendments to claims 1-4, 7, 13, 17 and 20-22 do not introduce new matter. Applicant provides a listing of the claims for the convenience of the Examiner.

For the reasons mentioned below, Applicant believes that the pending claims are not obvious over the cited references. Favorable reconsideration of the application, therefore, is respectfully requested.

### *Double Patenting*

The PTO states that claims 1-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 58-77 of

co-pending U.S. Patent Application No. 10/591,690<sup>1</sup>. Assuming that the provisional nonstatutory obviousness-type double patenting rejection is over claims 58-77 of the '960 application, Applicant will address the rejection when patentable subject matter has been identified in this application or the '960 application and request that the rejection be held in abeyance.

***Rejection under 35 USC §103***

***Patentability over the combination of Doty and Lieber***

Claims 1-6 and 13-21 are rejected as being unpatentable over Doty et al., (U.S. Patent No. 5,374,825) in view of Lieber et al., (U.S. Patent No. 7,254,151). According to the PTO, Doty et al., disclose a tanning device that has a chamber for receiving a human subject and a plurality of light sources for emitting UV light onto the subject's skin. The PTO acknowledges, however, that Doty fails to teach the use of a "nanostructure device" for emitting UV light as claimed. To remedy this deficiency in Doty, the PTO relies on Lieber. Applicant respectfully traverses.

Claim 6 has been cancelled, thus, rendering the rejection of claim 6 moot.

Applicant has amended claims 1 and 13, to recite a system that has a nanoparticles or a nanowire as the nanostructure light emitting device that emits only UVA. For the reasons mentioned below, the combination of Lieber and Doty fail to teach the system of claims 1 and 13 or the inventive methodology as recited by claim 17.

Doty teaches an apparatus and a method for measuring and controlling the amount of UV-exposure during tanning. Doty discloses in detail the components of the apparatus used for measuring UV-light emitted by UV-bulbs. There is no teaching or suggestion in Doty, however, of using UVA-light as recited by amended claims 1 and 13. Moreover, Doty's mention of tanning refer to his teaching of an apparatus having a photodiode system, analog to digital convertor, microprocessor and a display for measuring and displaying the quantity

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<sup>1</sup> Applicant believes that the PTO has made an error regarding the number of the co-pending application. The correct number is U.S. Patent Application No. 10/591,960.

of instantaneous or accumulated UV light emitted by a UV bulb. A skilled artisan would readily recognize that a UV bulb emits a broad spectrum of UV light, and not only UVA light as recited by the claims. In fact Doty discloses that the UV light received by the photodiode includes both UVA and UVB light (col. 4, lines 7-11). Stated differently, the photodiode disclosed in Doty is a photo-detector and not a light emitting diode. Doty therefore does not disclose the claimed system.

Leiber, on the other hand, teaches methods for making nanoscale optical components and devices. In particular, Lieber discloses methods for making nanoscopic wires and their assembly on surfaces for making nanoscale components. Nowhere, does Leiber teach or even suggest using the nanowires or components made using the nanowires for tanning or phototherapeutic applications, particularly, a system in which the nanostructure light emitting device emits only UVA light as recited by claims 1, 13 and 17.

Although Leiber discloses exciting a nanowire waveguide using UV-light, (Leiber, col. 28, example 6), contrary to the statements on page 4 of the Office Action, Leiber **does not** disclose that the emitted light is in the UV-range, much less in the wavelength range for UVA radiation. In fact, there is no suggestion in Leiber of using the nanoscopic wires or a system containing the nanoscopic wires that emit only UVA light for tanning and phototherapeutic applications.

Moreover, combining Leiber's teachings with those of Doty, would still fail to arrive at the claimed invention, because neither reference teach or suggest a system comprising a light emitting device that emits only UVA light.

The Supreme Court recently explained that a *prima facie* case of obviousness requires all elements of a claim to be in the prior art. In *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007), the Court stated that the proper question for evaluating obviousness is "whether there was an apparent reason to combine the known elements in the fashion claimed." *KSR*, 127 S.Ct. at 1741.

As mentioned above, neither, Doyt nor Leiber teach or suggest a nanostructure light emitting device that emits only UVA light, and the Office Action has failed to clearly

articulate why Leiber's disclosure would provide a reason to a person of ordinary skill to modify Doty's UV monitoring system, especially, when such a combination would still fail to arrive at a light emitting system emitting only UVA light as claimed. See MPEP §2142:

Thus, Applicant submits that the rejection is based on impermissible hind-sight reconstruction. For the reasons mentioned above, Applicant respectfully submits that amended claim 1, 13 and 17 are patentable over the combined teachings of Doty and Leiber.

The claims that depend from claims 1, 13 and 17, incorporate the limitations of their respective base claims. The dependent claims are also considered patentable for at least the same reasons mentioned above for claims 1 and 17.

*Patentability of Claims 14-16*

The Office Action states that "claims 14-16 are devoid of any structural and/or functional limitations and, therefore, are not given patentable weight." See Office Action at page 3, last paragraph. Applicant respectfully disagrees.

Claims 14-16 depend from independent claim 13 and recite a system comprising a first means for performing a particular function. Claims 14-16, thus, are means plus function claims are subjected to patentability examination under the guidelines for 35 USC §112, sixth paragraph.

In order to establish a *prima facie* case of unpatentability of a claim containing a §112, para. 6 ("means plus function") element, the PTO must find a prior art element that actually performs the claimed function. It is not enough that the prior art's structure is capable of performing the claimed function when the prior art specifically teaches against performing such a function. See MPEP §2183. For example, the predecessor court to the Federal Circuit stated:

We cannot agree with the board that the [means plus function] claims "merely recite 'a means'." They recite a means plus a function which is not to be found in Leutwyler [the prior art reference]. They therefore do not read on that reference and are not anticipated thereby.

*In re Mott*, 194 USPQ 305, 307 (CCPA 1977). The Federal Circuit cited *In re Mott* with approval in *RCA Corp. v. Applied Digital Data Systems, Inc.*, 221 USPQ 385 (Fed. Cir. 1984). On page 389, footnote 5, of the *RCA* decision, the Federal Circuit stated:

The claims here define the invention in terms of specific “means-plus-function” elements. The limitations which must be met by an anticipatory reference are those set forth in each statement of function. *In re Mott*, 557 F.2d 266, 269, 194 USPQ 305, 307 (CCPA 1977). Such a limitation cannot be met by an element in a reference that performs a different function, even though it may be part of a device embodying the same general overall concept. [emphasis added].

The PTO cannot focus only on the structure of the prior art and selectively ignore how it functions in the context of that prior art. The reference as a whole must be considered.

Claims 14-16 require that the claimed system performs a specific function, such as skin tanning, phototherapy and lupus phototherapy. Neither Doty nor Leiber teach tanning, phototherapy and lupus phototherapy by means of UVA light as claimed. Thus, claims 14-16 are patentable and not obvious over the combination of Doty and Leiber.

*Patentability over the combination of Doty and Leiber in view of Salansky*

Claims 22-24 are rejected as being unpatentable over Doty et al., in view of Lieber et al., as applied to claims 1-6 and 13- above, and further in view of Salansky et al., (U.S. Patent No. 6,949,900). The PTO acknowledges that neither Doty nor Leiber teach or suggest a method for treating Lupus using only UVA light as claimed. However, treatment of Lupus is disclosed by Salansky, therefore, the PTO opines that “it would have been obvious to one of ordinary skill in the art to modify the teachings of Doty in view of Leiber and further in view of Salansky to arrive at the claimed method for treating Lupus.” Applicant respectfully traverses.

As discussed above, neither Doty nor Leiber alone or in combination teach the claimed method. Doty fails to teach a method for phototherapy using only UVA light and neither does Leiber whose focus is on a method for making nanoscopic wires and their

assembly on surfaces for making nanoscale components. Moreover, neither Doty nor Leiber teach a method for phototherapy using UVA-1 light as recited by new claim 44.

Salansky discloses as background information, that UV or red light was used to treat pockmarks and lupus. (Salansky at col. 1, lines 17-20). The Salansky patent, however, focuses on an apparatus for treating a biological tissue disorder using light having selected optical parameters and developing protocols for low energy photon therapy (LEPT) for a range of disorders. In fact, Salansky discloses that the wavelength of light used for LEPT is in the visible and IR range (400 to 2000 nm) and not UVA light as claimed. The tables and working examples provide further support for using light of wavelength in the range of 630 – 1100 nm for LEPT.

Page 5 of the Office Action further states that

“Since the use of UV light for treating lupus is known in the art, it would have been obvious to use a nanostructure element to shift shorter wavelength UVC or/or [sic] UVB light to a longer UVA light in order to reduce exposure of damaging shorter UV wavelengths to the subject’s skin.”

See Office Action at page 5, first paragraph (emphasis added).

However, neither Slansky, Leiber nor Doty disclose a light emitting device that emits only UVA light, much less a method for treating lupus using only UVA light as claimed. Moreover, none of the cited references disclose that long wavelength UV light such as UVA light reduces damage to the skin, much less a teaching or suggestion that UVA light alone is effective at treating lupus as claimed. Further, without a teaching or suggestion in the cited references that UVC and UVB light can be shifted to a longer wavelength UVA light, there would be no reason for a skilled artisan to use a nanostructure element for emitting only UVA light as claimed.

The teachings of Salansky when combined with those of Doty and Leiber, therefore, do not render the claimed method obvious. Claim 22 is considered patentable over the cited references in combination. Claims 23, 24 and 44 depend from patentable claim 22 and

incorporate all its limitations. The dependent claims are also patentable for at least the same reasons mentioned above for claim 22.

All pending claims are considered non-obvious and patentable over the cited references. The Examiner is respectfully requested to withdraw the obviousness rejections.

CONCLUSION

Applicant believes that the present application is in condition for allowance. The Examiner, therefore, is invited to contact the undersigned attorney should any further issues remain.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16 - 1.17, or credit any overpayment, to the same deposit account. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to the same deposit account.

Respectfully submitted,

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